

PATOKA LAKE
Crawford, Dubois, and Orange Counties
2006 Fish Management Report

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EXECUTIVE SUMMARY

- Patoka Lake is an 8,800-acre flood control reservoir. There are 11 boat ramps at the lake. The lake is best known for its quality largemouth bass and channel catfish fishing. The lake also has good fishing for white bass and striped bass.
- There were three surveys conducted in 2006. A general survey in May, a largemouth bass tournament monitoring survey that ran from March through October, and a crappie survey that occurred in March.
- In the general survey, 24 fish species and one hybrid were sampled. The total catch was 7,960 fish that weighed approximately 2,538 lbs. Gizzard shad were most abundant by number followed by bluegill, longear sunfish, and largemouth bass. Largemouth bass were most abundant by weight followed by gizzard shad, channel catfish, and common carp.
- The largemouth bass tournament monitoring survey includes results for 39 tournament days. A total of 3,828 anglers fished in the reporting tournaments. They weighed-in a total of 2,932 legal size bass that weighed an estimated 7,841 lbs. The average weight and length of a weighed-in bass was 2.67 lbs and 16.9 in.
- A total of 2,189 white crappie and 255 black crappie was sampled in March. Their catch rates were 121.6/trap net lift for white crappie and 14.2/trap net lift for black crappie. Growth was slow for both species.

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INTRODUCTION

Patoka Lake is an 8,800-acre flood control impoundment located in Crawford, Dubois, and Orange Counties. The reservoir was created in 1977 when a dam was completed across the Patoka River 13 mi east of Jasper. The Department of Natural Resources (DNR) operates seven State Recreation Areas at the lake. The Newton-Stewart State Recreation Area is the most developed with campgrounds, swimming beach, visitor center, marina, and other attractions. Eleven boat launching ramps provide anglers and boaters access to the lake. The Kings Bridge boat ramp is an unimproved ramp while the other boat ramps are concrete. There is a \$5.00 non-motorized and \$20.00 motorized annual state-wide lake pass for boats. If accessing the lake through the Newton-Stewart Recreation Area, there is also an additional entrance fee. Areas for bank fishing are numerous and are located by any road bordering the lake.

Largemouth bass were protected by a 14-in minimum length limit through 1988. A 12 to 15-in bass slot size limit was enacted in May 1989 and was changed in 1996 to a 15-in minimum length limit. This regulation was also timely due to the appearance of gizzard shad in June 1996.

In 2005, bluegill outnumbered gizzard shad for the fourth straight year. Bluegill stock density indices (PSD, RSD7, and RSD8) have not changed and indicate that fish less than 6.0 in continue to dominate the bluegill population. The largemouth bass electrofishing catch rate was substantially higher than the previous 3 years. The bass PSD decreased to 53 due to the increase of 8.0 to 12.0-in fish. This decrease was actually good because the 2004 PSD of 65 was approaching the upper limits of the “balanced” bass population range.

METHODS

General survey

The survey was conducted from May 8 through June 7, 2006. Fish collection effort consisted of 6.25 h of pulsed DC night electrofishing, 12 overnight trap net lifts, and 24 overnight gill net lifts. Two individuals collected fish stunned by the electrofisher. The general survey guidelines (Shipman 2001) call for 7.0 h of night electrofishing, but due to the poor weather combined with time restraints only 6.25 h was completed. Netting effort conformed to the survey guidelines. Water chemistry parameters were measured on May 8 according to the general survey guidelines. Also, water temperature and DO profiles were taken again on June 5

to determine if the lake stratified.

Fish collected were measured to the nearest 0.1 in TL. Weights for all species were determined from the Fish Management District 7 averages. Proportional stock density and RSD indices were used to evaluate the largemouth bass and bluegill populations (Anderson and Neumann 1996). The bluegill fishing potential index (BGFP) was used to evaluate the quality of the bluegill fishing (Ball and Tousignant 1996). A single factor analysis of variance statistical test was used to compare some of the pre and post gizzard shad era data. Scale samples were taken from a subsample of sport fish for age and growth determination.

Largemouth bass tournament monitoring

Organizations conducting tournaments were mandated by their permit to record and send in their bass tournament data to the Division of Fish and Wildlife. Data sheet information included hours fished, number of participants, big bass weight, total weight, and total number weighed-in. Recording bass lengths to the nearest 0.5 in was optional.

Crappie survey

White and black crappie were sampled from March 13 through March 16 upstream from the Walls boat ramp near Kings Bridge on County Road 450W. Sampling effort consisted of 18 overnight standard trap net lifts. All crappie were measured to the nearest 0.1 in and weighed to the nearest 0.01 lb. Otoliths were removed from a subsample of both species for age and growth determination. Air and water temperatures were recorded daily.

RESULTS

General survey

Twenty-four fish species and one hybrid were sampled. The total catch was 7,960 fish that weighed approximately 2,537 lbs (Appendix 1). Gizzard shad were most abundant by number (39%), followed by bluegill (27%), longear sunfish (9%), largemouth bass (8%), and white crappie (4%). Largemouth bass were most abundant by weight (30%), followed by gizzard shad (19%), channel catfish (16%), common carp (11%), and spotted sucker (6%). A complete list of species sampled and their relative abundances are in Appendix 1.

A total of 3,065 gizzard shad was sampled that weighed 475 lbs. They ranged in length from 4.8 to 11.9 in. Gizzard shad catch rates were 446.2/electrofishing h, 11.2/gill net lift, and 0.7/trap net lift. The electrofishing catch rate in 2005 was 296.0/h. Previous electrofishing catch rates ranged from 274.0 (2002) to 1,401.0/h (2001).

A total of 2,147 bluegill was sampled that weighed 144 lbs. Bluegill ranged in length from 1.5 to 7.5 in. The electrofishing catch rate decreased from 629.0 to 336.8/h. The gill net and trap net catch rates were 0.8 and 2.0/lift. Bluegill growth was average when compared to the district's averages, however, it has substantially declined since 1996 (Figure 1). For example, an age-5 bluegill in 1996 averaged 8.8 in compared to 6.2 in presently. An age-6 bluegill was the oldest collected and that year class averaged 7.3 in.

The bluegill PSD was 10 (Figure 2). The PSDs have been less than 11 since 1998 and are significantly lower since 1996 ($F = 20.89$, $df = 13$, $P < 0.01$). The PSD should be in the range of 20 to 60 for a balanced population. The bluegill RSD7 has been 1 the last 3 years and the RSD8 has been 0 since 1998. Both indices have significantly decreased since 1996 ($F = 93.32$, $df = 12$, $P < 0.01$) and ($F = 64.63$, $df = 13$, $P < 0.01$) (Figure 3). The BGFP value decreased from 13 to 11 (out of a possible 40), which rates bluegill fishing as marginal. The BGFP has ranged from 8 to 13 since 1998. The highest BGFP recorded was 24 in 1996.

A total of 725 longear sunfish was sampled that weighed 34 lbs. They ranged in length from 2.3 to 5.7 in. The electrofishing catch rate was 115.3/h.

A total of 616 largemouth bass was sampled that weighed 748 lbs. They ranged in length from 3.0 to 21.6 in. The electrofishing catch rate decreased 32% to 97.4/h. Bass growth was good and nearly identical to 2005 results. An age-4, 5, 6, and 7 bass averaged 13.3, 15.8, 17.1, and 18.2 in (Appendix 1).

The bass PSD increased from 53 (2005) to 58 and is currently in the correct range (40 to 70) for a balanced population (Figure 2). The PSD has significantly increased since 1996 ($F = 27.97$, $df = 13$, $P < 0.01$). The RSD15 index value increased from 27 to 34 and has significantly increased since 1996 ($F = 9.11$, $df = 13$, $P = 0.01$) (Figure 4). The RSD17 index increased from 11 to 18 and has also significantly increased since 1996 ($F = 4.95$, $df = 13$, $P = 0.04$). The RSD18 and RSD19 values are 9 and 4 which are substantial changes, but not statistically significant.

A total of 344 white crappie and 27 black crappie was sampled. White crappie ranged in length from 4.9 to 13.2 in, while black crappie ranged from 4.1 to 10.2 in. White crappie catch rates were 14.9/electrofishing h, 9.3/gill net lift, and 2.3/trap net lift. The black crappie catch rates were 2.6/electrofishing h and less than 1.0/lift for the gill net and trap nets. The 2005 electrofishing catch rates were 21.3/h for white crappie and 7.3/h for black crappie. Crappie growth is discussed in the crappie survey results section.

A total of 305 channel catfish was sampled that weighed 405 lbs. They ranged in length from 5.8 to 28.5 in. Channel catfish catch rates were 3.0/electrofishing h, 11.9/gill net lift, and none were caught in trap nets. The 2004 catch rates were 5.1/electrofishing h, 10.9/gill net lift, and 0.1/trap net lift. No netting was conducted in 2005, but the electrofishing catch rate was 4.3/h. The gill net catch rates have significantly increased since 2000 ($F = 10.44$, $df = 5$, $P = 0.03$) (Figure 5). The average lengths of the sampled channel catfish from 2004 to 2006 decreased from 16.4 to 14.4 in, and the percentage of catfish sampled that were at least 20.0 in decreased from 23% to 12%. No channel catfish were aged.

A total of 166 redear sunfish was sampled that weighed 47 lbs. They ranged in length from 4.8 to 9.4 in. Relative abundance was 2% by both number and weight. The electrofishing catch rate slightly decreased to 25.6/h. The gill net and trap net catch rates were both less than 1.0/lift. Redear sunfish growth was similar to 2005 and at the low end of the average range when compared to the district's averages. Age-4 and age-5 redear averaged 6.7 and 7.6 in.

A total of 123 white bass was sampled that weighed 111 lbs. They ranged in length from 4.9 to 16.6 in and averaged 12.0 in. Thirty-two percent of the white bass were at least 14.0 in. Catch rates were 5.3/electrofishing h, 3.8/gill net lift, and none were caught in trap nets. The 2004 and 2005 electrofishing catch rates were 1.6/h and 4.1/h. White bass grew good with age 3 through age 5 averaging 12.7, 14.4, and 15.5 in.

Fifteen smallmouth bass were sampled that weighed 7 lbs. They ranged in length from 6.0 to 12.7 in. All were caught by electrofishing and the catch rate was 2.4/h. The 2005 electrofishing catch rate was 5.6/h.

Largemouth bass tournament monitoring

Thirty-nine tournament days were reported compared to 53 in 2005 (Appendix 2).

Sixteen days were in the spring (March through May), 15 during the summer (June through August), and 8 in the fall (September and October). A total of 3,828 anglers caught 2,932 legal size bass that weighed approximately 7,828 lbs. The catch rate was 0.09 bass/h which equates to 11.1 h fished for each bass weighed-in. The catch rate has significantly increased since 1996 ($F = 37.88$, $df = 18$, $P < 0.01$). Catch rates since 2002 have hovered around 0.10 bass/h while prior to 1997 the highest catch rate was 0.04 bass/h (Figure 6). The average length and weight were 16.9 in and 2.67 lbs. The big bass weighed-in ranged from 2.75 to 7.31 lbs and averaged 5.19 lbs. A good percentage of large bass were weighed-in with 31% being at least 18.0 in and 7% at least 20.0 in. Only 19% of the bass in 2005 were at least 18.0 in. The 2005 bass catch rate, average length, and average weight were nearly identical to 2006 results.

Crappie survey

A total of 2,189 white crappie was sampled that weighed 161 lbs (Appendix 3). They ranged in length from 4.2 to 15.0 in and 98% were less than 8.0 in. The average length of the white crappie sampled from 2004 to 2006 decreased from 5.8 to 5.4 in. The trap net catch rates have steadily increased since 2002. The trap net catch rate increased 85% from 2004 to 121.6/lift. Catch rates in 2002 and 2003 were 41.0 and 13.0/lift. White crappie grew extremely slow. Average lengths of age-6 through age-9 white crappie ranged from 7.2 to 7.9 in. Only three age-5 crappie were sampled and their average length was 11.4 in.

A total of 255 black crappie was sampled that weighed 24 lbs. They ranged in length from 3.5 to 8.3 in. All but two of the black crappie were less than 8.0 in. The trap net catch rate was 14.2/lift. Previous catch rates ranged from 2.0 (2002) to 6.0/lift (2004). Black crappie grew extremely slow. Average lengths of age-3 through age-8 black crappie ranged from 5.8 to 7.3 in.

DISCUSSION

The largemouth bass electrofishing catch rate substantially decreased from 2005, but this was primarily due to the 2005 catch rate being unusually high. The 2006 catch rate was similar to three of the last four fish surveys at approximately 100/h. The big difference between the two surveys was the catch of bass smaller than 15.0 in. The catch rate for bass greater than 15.0 in (28.0/electrofishing h) did not change from 2005.

The reduction in the catch of smaller bass increased the stock indices. The improved stock indices indicate that large bass comprise a larger proportion of the population. The RSD15 through RSD19 all increased by at least 24% and the RSD17 had the highest increase of 64%. The bass tournament monitoring data also supports the increased RSDs with the percentage of 18.0 in and larger bass increasing 12% from 2005. The high proportion of large bass is due to the abundant forage of gizzard shad, stunted bluegill, longear sunfish, warmouth, spotted sucker, and green sunfish. These forage species have a combined relative abundance by number of 77%. This data supports that Patoka Lake is a quality bass fishery.

The channel catfish population has exploded since 1996 as shown by the increased gill net catch rates. The channel catfish population is maintained through natural reproduction as no channel catfish stockings have occurred since 1978. The catfish population is benefiting from reduced bass predation as bass have shifted their primary foraging to gizzard shad. Harvest could be impacting the number of larger catfish because the average length sampled decreased by 2.0 in and the percentage sampled that were at least 20.0 in decreased 11% since 2004. The 2007 angler creel survey should answer this question. Patoka Lake is an excellent channel catfish fishing lake even with the discussed size decreases.

The white bass fishing is good as their catch rates are higher than they have been in the last 10 years. Most of the white bass sampled were large as they averaged 12.0 in.

Crappie fishing at Patoka Lake can be considered poor for quality fish. White crappie is the dominant species and their population is stunted due to extremely poor growth caused by an overabundant population. Good growth can be obtained as shown by the 2001 year class. Only three age-5 white crappie were sampled during the crappie survey and they were growing substantially faster than all the other year classes. Crappie fishing can improve, but it is going to take a few years of poor reproduction and survival to decrease the lake's crappie population to the point that their growth can rebound.

Bluegill fishing is not good at Patoka as indicated by the low stock indices and BGFP score. The PSD, RSD7, and RSD8 have changed little and indicate that fish less than 6.0 in continue to dominate the bluegill population. Very few 7.0 in and larger bluegill are present in the population. The low numbers of big bluegill are due to poor growth caused by competition with gizzard shad.

Patoka's striped bass population is providing a new exciting fish for anglers to catch in southwest Indiana. Fishing for striped bass should continue to improve if the lake receives its annual stocking of 44,000 fingerlings. A double stocking occurred in 2006 consisting of 98,774 fingerlings. The striped bass population is evaluated on a biennial basis in odd numbered years. Consequently, few striped bass were sampled in the 2006 survey because they are not normally caught if they are not specifically targeted.

Other game fish species starting to show up in greater numbers are smallmouth bass and flathead catfish. Their population levels are not high enough to specifically fish for these species, but they can be caught incidentally while fishing for other species.

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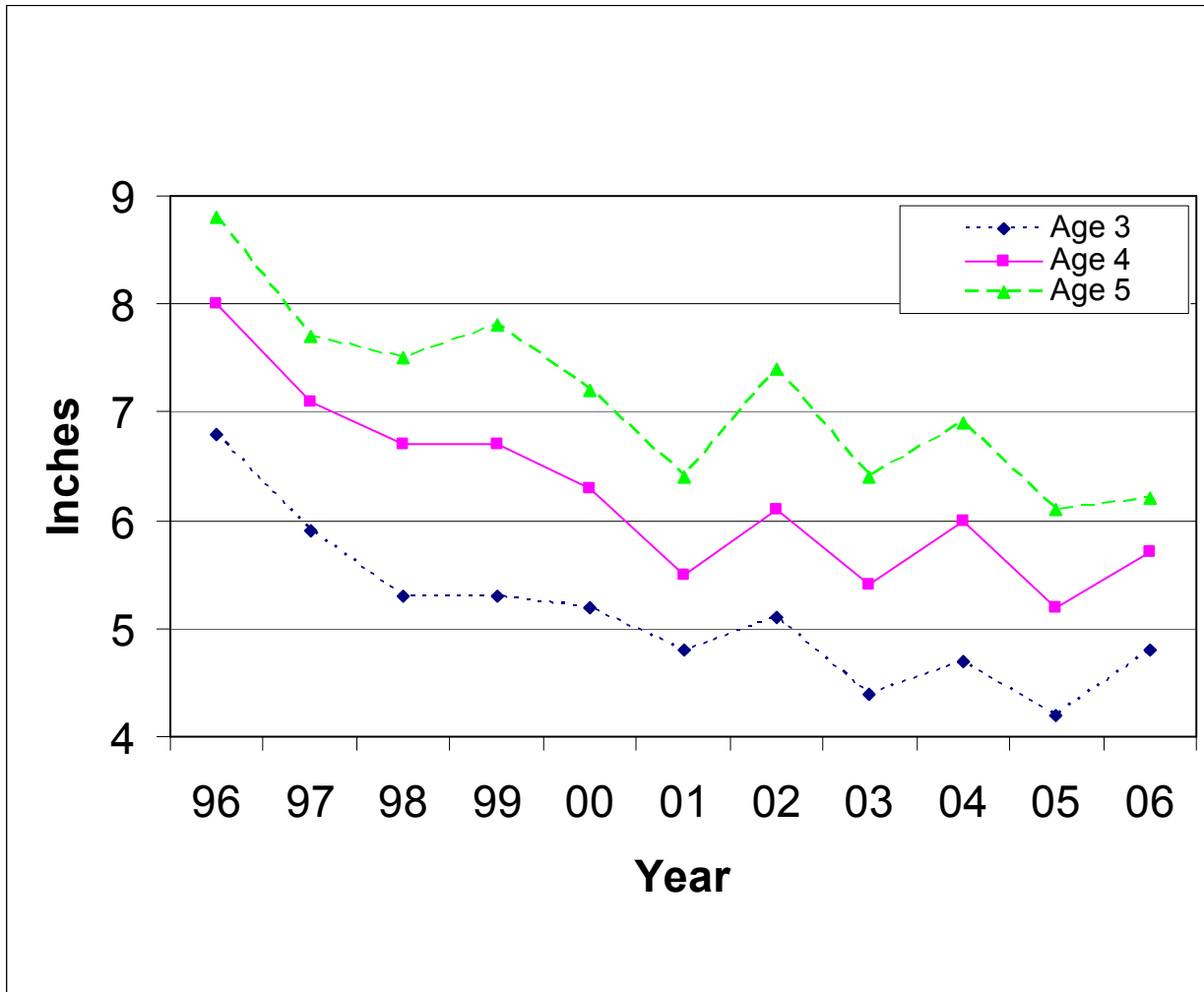


Figure 1. Bluegill growth for age 3 through age 5, 1996 through 2006.

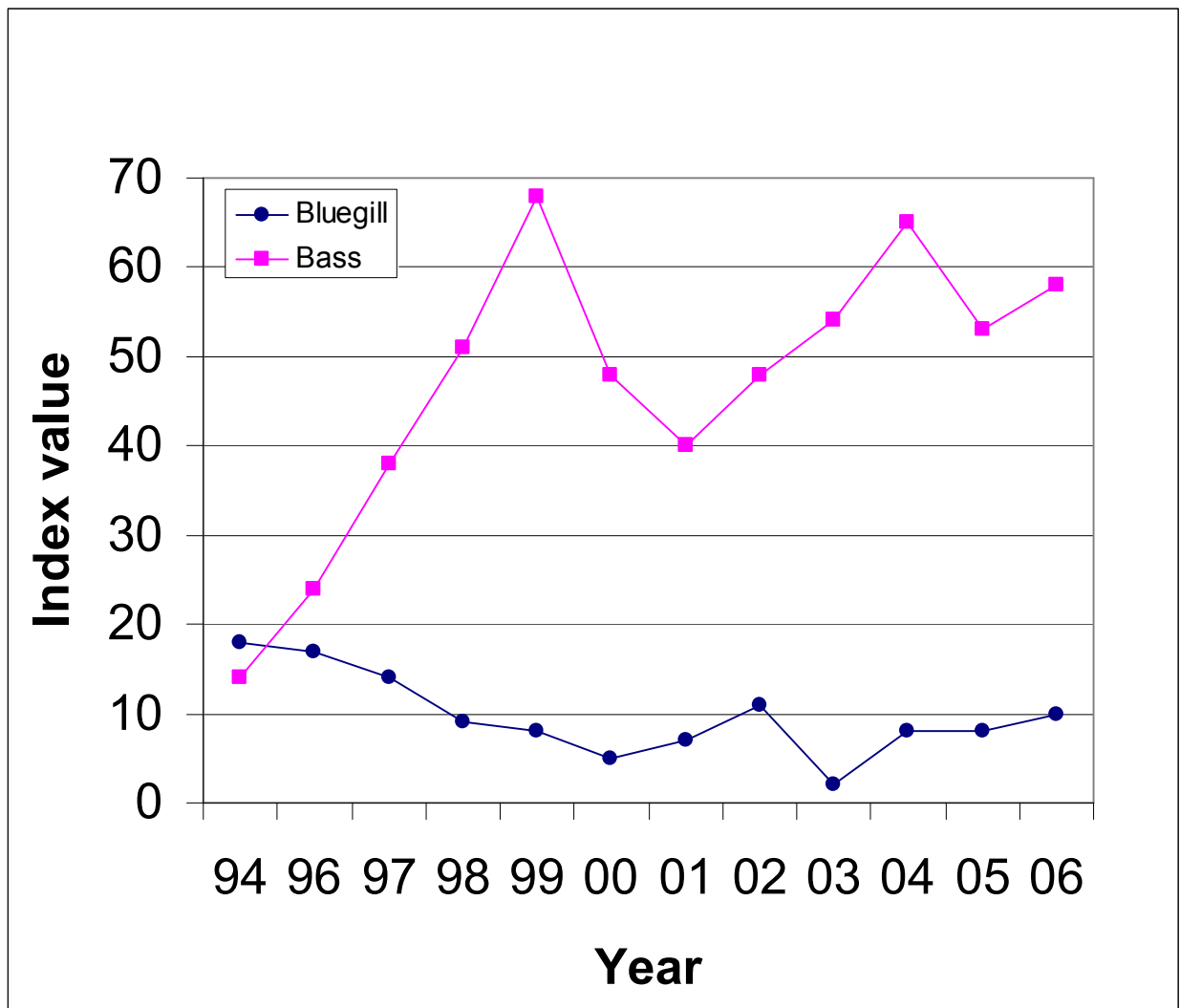


Figure 2. Bluegill and largemouth bass PSD values, 1994 through 2006.

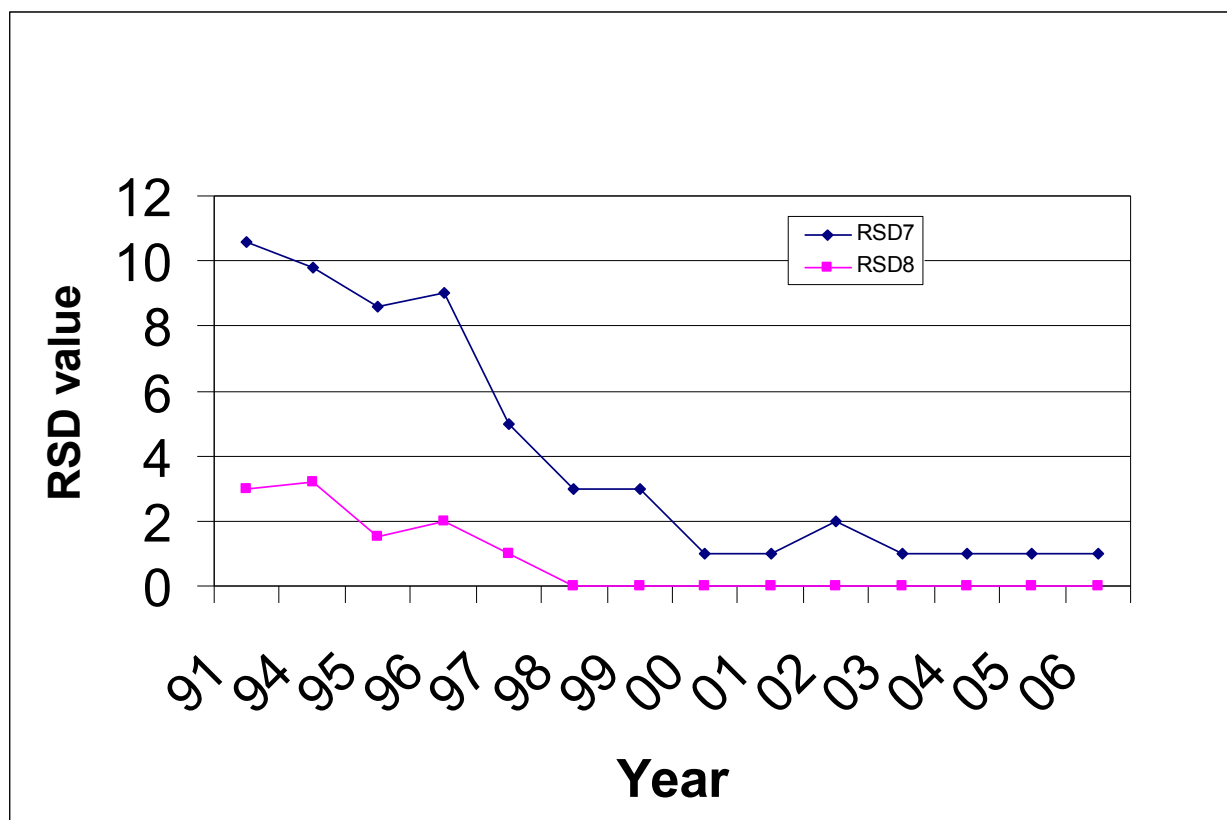


Figure 3. Bluegill RSD values, Patoka Lake 1991 through 2006.

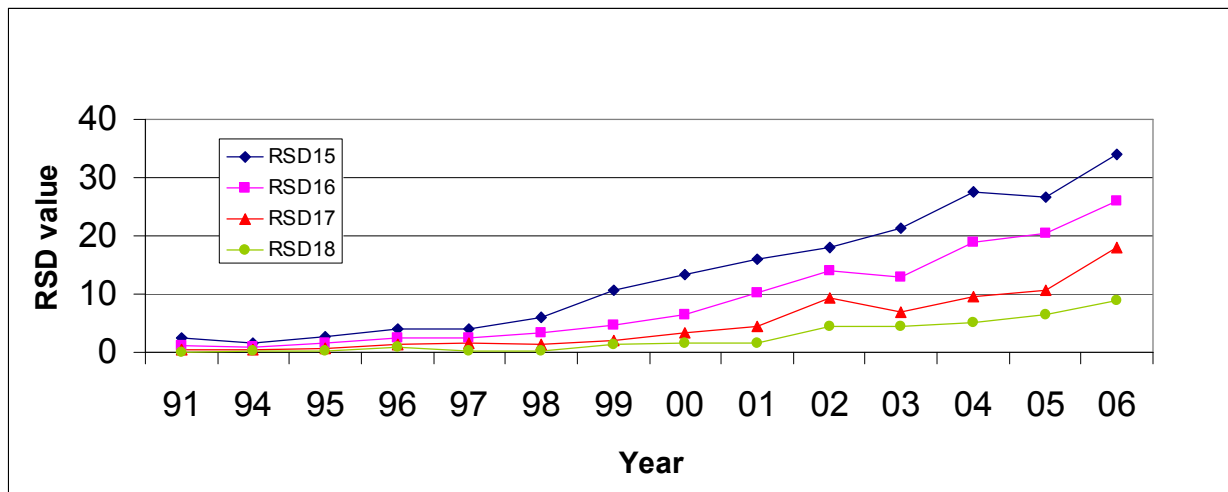


Figure 4. Largemouth bass RSD values, 1991 through 2006.

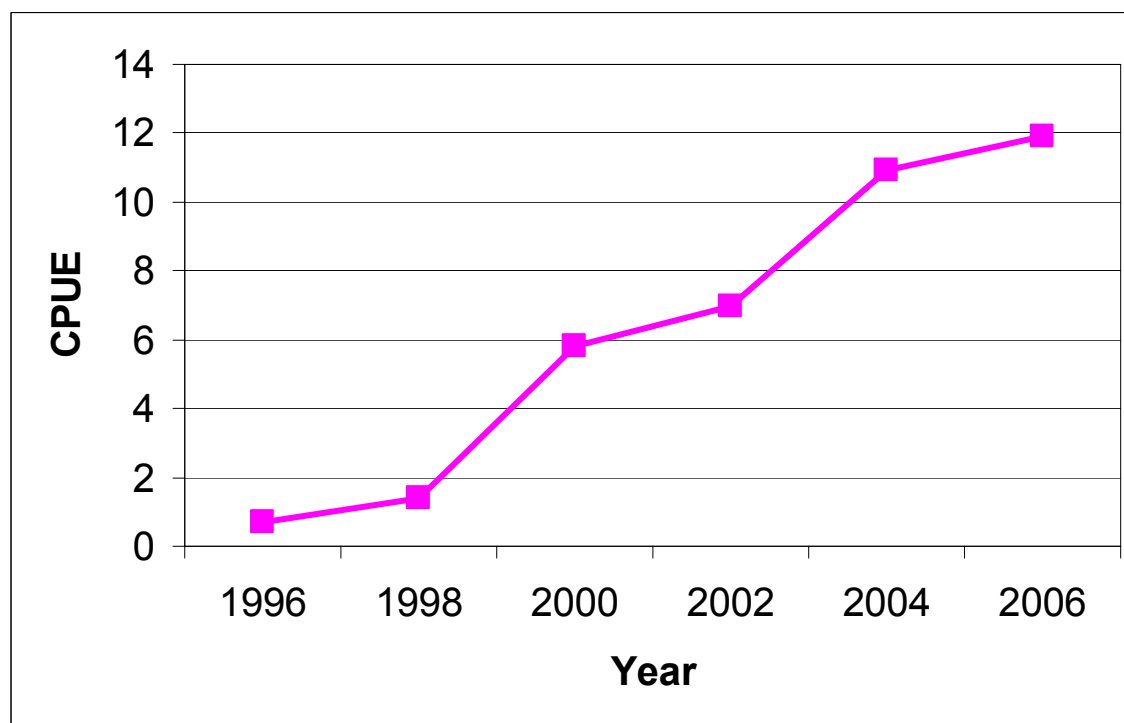


Figure 5. Channel catfish gill net catch per unit effort, 1996 through 2006.

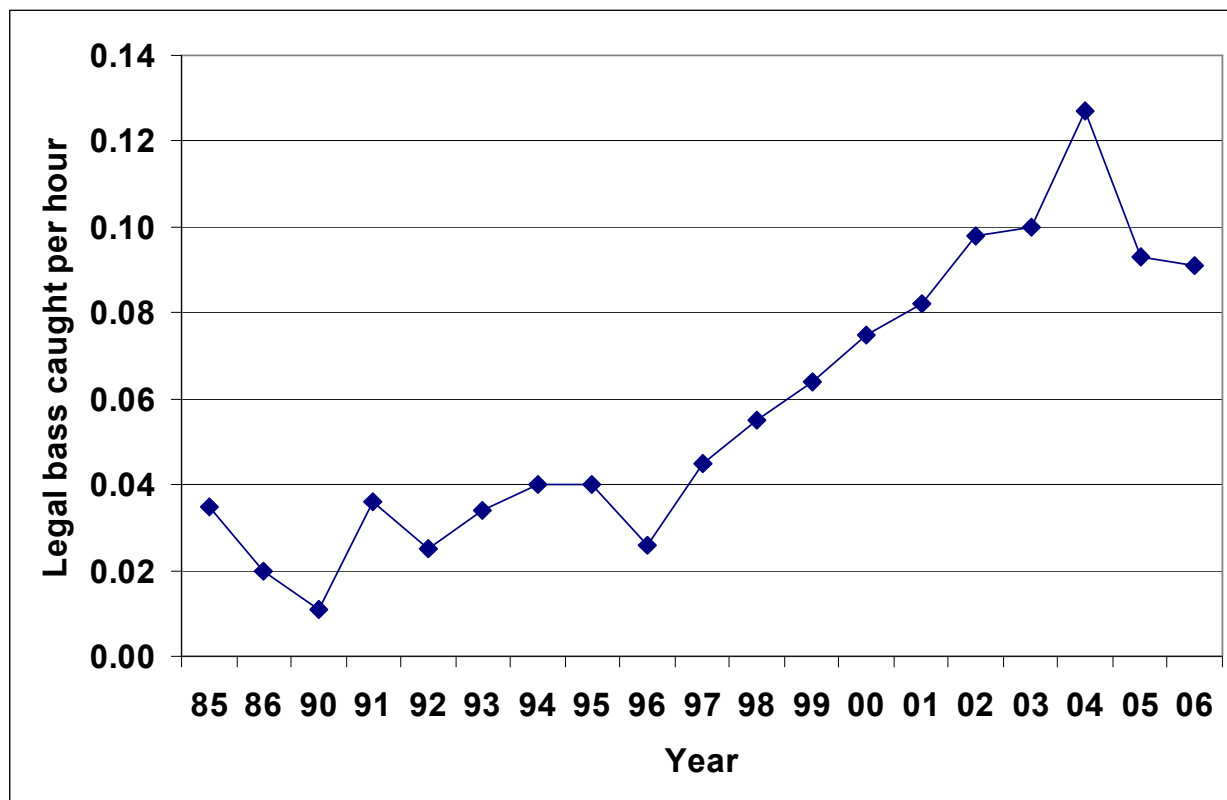


Figure 6. Tournament catch rates for legal size largemouth bass, 1985 through 2006.

APPENDIX 1

General Survey Data

APPENDIX 3

Crappie Survey Data